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GEOLOGICAL CONSIDERATION

The Hôei Mine, a lead producer in Kyushu, is located in Tsuzura, Ogata-machi, Ôno-gun, Ôita Prefecture. The mining district is geologically composed of many sedimentary and igneous rocks of various ages.

Owing to the intrusion of late Tertiary granodiorite, all of the sedimentary rocks were highly metamorphosed into hornfels and crystalline limestone. The general trend of the strata is NE-SW to ENE-WSW, and each formation is separated by a thrust of the same direction, dipping to NW with high angles in general. The stratigraphic sequence and igneous geology of the mining district is as follows:

Quaternary.....	Alluvial deposits
	~~ (unconformity)
Neogene.....	Hornblend biotite granodiorite
	———————— (intrusion)
	Black shale
	Sandstone with lithoidite breccia
	Sobosan volcanics (lithoidite)
	═══════════ (fault)
Late Permian~early Triassic..	Sheared granite and ultrabasic rocks
	———————— (intrusion)
Carboniferous~Permian	Chichibu system
	═══════════ (fault)
Middle Gotlandian	Kitakami system (Tsuzura formation)

The Tsuzura formation is mainly composed of siliceous slate, hornfels and sandstone hornfels with the intercalation of lenticular crystalline limestone of moderate thickness at three horizons. Although the upper and lower limits of the formation are unknown, the total thickness is at least 300 m, and is intruded by the sheared granite and ultrabasic rocks.

The Tsuzura formation occupies a considerably extensive area in the Obira Mine district, about 7 km south-west of the Hôei Mine, with a zonal structure of about 1 km wide, where the lithic character, the thickness of the formation, and the stratigraphic relation to other rocks are quite the same as in Hôei.

In early August, 1958, the writer discovered an interesting Gotlandian Tabulata coral from the topmost thin crystalline limestone of the Tsuzura formation, exposed at the western slope of the Katamuki-yama, east of the Ôgiri Pit of the Hôei Mine. The specimen is identifiable with *Dania* which is a very rare genus of the Family Chaetetidae.

DESCRIPTION

Order Tabulata Family Chaetetidae Subfamily Chaetetinae
Genus *Dania* Milne-Edwards and J. Haime, 1849
Dania tsuzuraensis Noda, n. sp. (Pl. 13, figs. 1–7)

The original description of *Dania* given by H. Milne-Edwards and Jules Haime (Mémoire sur les Polypiers appartenant aux groupes naturels des Zoanthaires perfores et des Zoanthaires tabules. Compt. Rend. du l'Acad. Sci. Paris, Vol. 29, p. 261, 1849) is as follows :

"Genre *Dania*. Différe des Chaetetes en ce que les planchers se continuent entre les divers polypiérites, de facon à diviser la masse en une multitude d'étages parallèles. Ex. : *D. huronica*, Nob. Coll. Stokes."

Several fragmental specimens of this form are now at hand, and they are all preserved in a condition sufficient for their specific determination, though the microstructures of the skeletal elements are often indistinct. The skeletal elements are occasionally replaced by crystalline calcite, and their structure is usually better seen by reflected light than by transmitted light. They are usually more clearly discernible on the weathered surface of the limestone than on their freshly fractured one, owing to the difference in colour and relief.

Exact form of corallum unknown, but probably glomerate, up to 3 cm thick and over 6 cm broad. Corallites very long, slender and basaltiform, and in general more or less bent. Widths of corallites very narrow, about 0.39 to 0.45 mm. Wall a little thickened, measuring about 0.11 mm, tabularium polygonal but not rounded. Tabulae connected through the contiguous corallites on same level and unequally spaced, dividing whole mass into a great number of parallel strata. Thickness of tabulae about 0.08 mm in average.

As noted above, the present form may safely be refered to *Dania* in the general characters of walls and tabulae. Of recorded species, *Dania huronica* described by H. Milne-Edwards and J. Haime from the Gotlandian of North America is close to the present form. From the former, however, the present form is easily distinguishable by having slender corallites, many tabulae and thin walls.

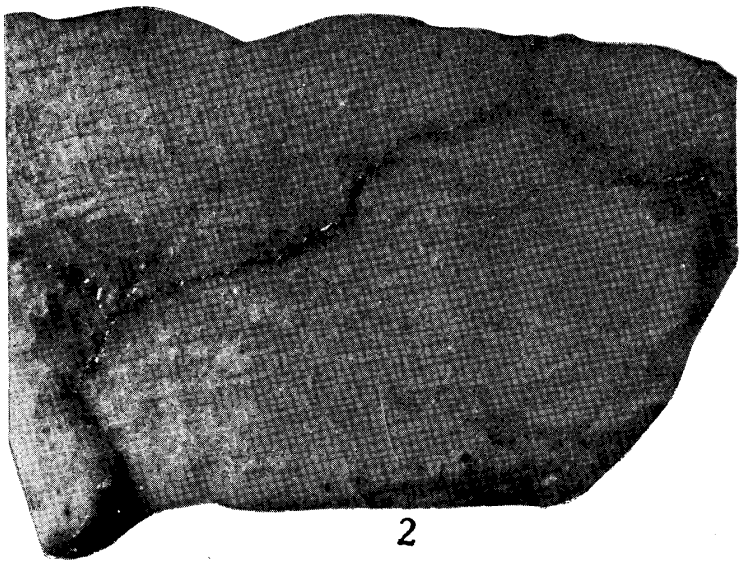
Dania is a characteristic fossil of the Gotlandian, but is very rare in general throughout the world. By the discovery of *Dania* from the Tsuzura formation, it is unquestionable that the formation is Gotlandian in age. The writer holds that the Tsuzura formation may be correlated to the Middle Gotlandian deposits distributing in other localities in the outer zone of South-west Japan, from paleontological data, lithic character and the geological structure.

EXPLANATION OF PLATE 13

Dania tsuzuraensis Noda, n. sp.

Fig. 1. Weathered tangential surface ; ×3.8
Fig. 2. Longitudinal section ; ×1.7
Fig. 3. Longitudinal section of the same specimen, Fig. 2 ; ×3.2
Fig. 4. Tangential section ; ×3.4
Figs. 5, 6, 7. Longitudinal sections ; ×3.4

1



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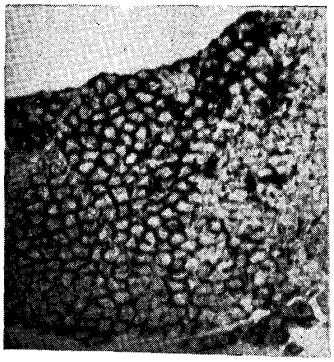

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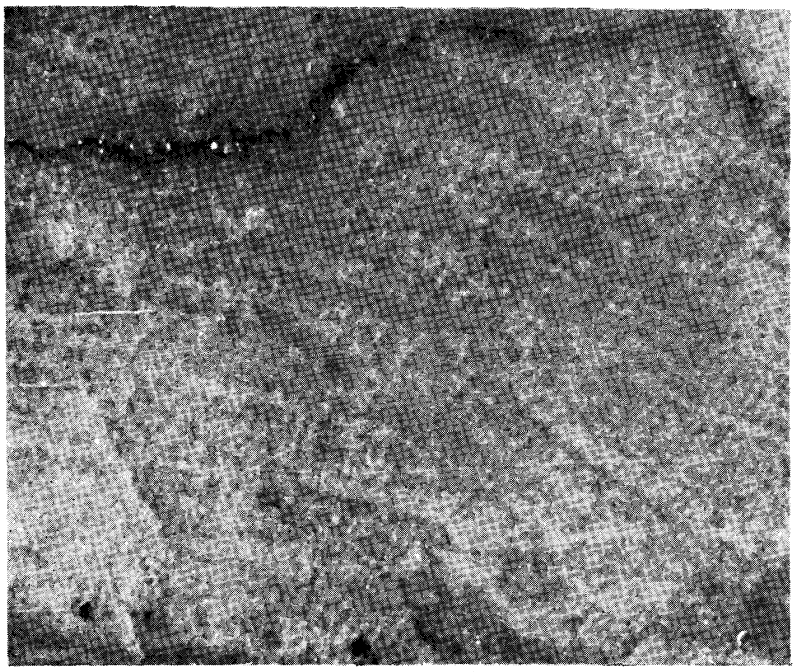

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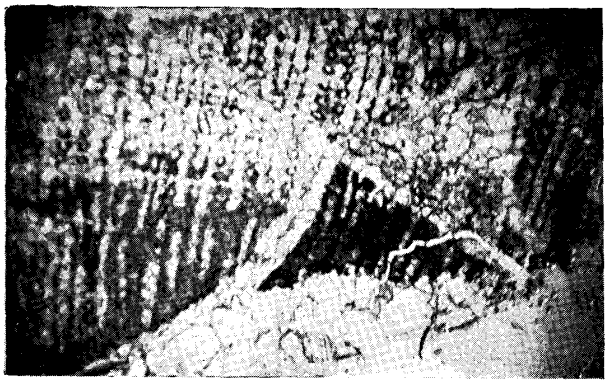

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